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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Masayoshi Kobayashi

Application No.: 09/770,017   Confirmation No.: 5189

Filed: January 25, 2001   Art Unit: 2171

For: DATA STRUCTURE FOR SEARCH   Examiner: Hung Q. Pham

APPELLANT'S REPLY BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop Appeal Brief - Patents
Randolph Building
Alexandria , VA 22314

Dear Sir:

This Reply Brief is pursuant to 37 CFR § 41.41(a), and is responsive to the Examiner's Answer mailed on July 25, 2005, in connection with the Appeal from the final rejection of claims 7, 10, 14, 22, 24-27 and 29 mailed September 23, 2004, in the above identified U.S. Patent application.

No fees are believed due for the filing of this Reply Brief. However, if any fee is due, the Patent Office is authorized to charge such fee to Deposit Account No. 50-2215.

Appellant wishes to thank the Examiner for the above-identified Examiner's Answer.

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As described in Appellant's Appeal Brief, each of the claims under final rejection is patentable over the references cited by the Examiner. Appellant maintains each argument presented in the Brief.

In the Examiner's Answer, the Examiner presented several arguments in rebuttal of the positions taken in the Appeal Brief. Several of these rebuttal points are inaccurate and/or misleading and will be addressed below.

(A) With regard to the independent claims, the Examiner at several points in the Answer refused to give patentable weight to the recited determination of whether a selected node satisfies a condition, e.g., condition 1) in independent claim 24, that an amount of memory required to store a data structure including the equivalent table in place of the selected sub-tree is smaller than that required to store the assumed tree structure.

The reasoning given for this failure to provide patentable weight to this express limitation is that, in the Examiner's view, "an amount of memory required to store a data structure including the equivalent table in place of the selected sub-tree structure is *always* smaller than that required to store the assumed tree structure." Examiner's Answer, at page 5 (emphasis in original). On the basis of this surmise, the Examiner took the position that there was no need to determine if the prior art met this limitation to sustain a rejection.

This is incorrect. In the first place, *all* words in the claim must be accorded patentable weight. Second, it *is* possible for the "data structure," i.e., the structure that includes an equivalent tables in place of selected sub-tree, to be larger than the assumed tree structure. In some instances, replacing the selected sub-tree with an equivalent table would actually increase the memory consumption.

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An illustrated example of a sub-tree that does not meet the above-mentioned condition is provided in appendix A. As shown in appendix A, a sub-tree A is a candidate that will be checked to see if it meets the above-mentioned condition. This sub-tree A has 8 nodes. The equivalent table B in accordance with the Applicant's claimed invention would have 8 entries. Each entry C, as shown in appendix A, assuming Y bits of related information, would have a memory consumption of (21 + Y) bits. Thus, the equivalent table to replace sub-tree A would have a memory consumption of (21 + Y) * 8. On the other hand, the memory consumption related to each node in the sub-tree that is a candidate for replacement is (18 + Y) bits, again assuming Y bits of related information. In this case, the memory consumption for the candidate sub-tree would be (18 + Y) * 8, which is *less than the size of the equivalent table*. Thus, appendix A illustrates a sub-tree for which the condition, condition 1) for example in claim 24, would not be met.

In view of the foregoing, it is clear that the Examiner's above-mentioned surmise is technically incorrect. The determination as to the above-mentioned condition *must* be given patentable weight. In view of the fact that the Examiner used this incorrect technical analysis to form the basis for the rejection of several of the independent claims, the technical basis of the rejection is flawed, rendering the rejections untenable. For at least this reasons, the rejections are believed obviated.

(B) With regard to independent claims 24-27, the Examiner took the position that the prior art need not meet both of conditions (1) and (2). This is based on his conclusion that those claims recite that the replacement of the candidate sub-tree by the equivalent table will take place if *either* of the conditions are met. Thus, according to the Examiner, independent claims 24-27 recite the conditions in the alternative and therefore the prior art must only test for one of the conditions. See, e.g., the statement at page 15 of the Answer: "[c]laims 24-27 use either predetermined condition (1) or (2)

for replacing a selected node with an equivalent table. Claim 29 uses both of the predetermined conditions . . . ." This is not correct. All of the independent claims replace the selected node with an equivalent table only if both conditions are met.

Specifically, claim 24 recites, inter alia, "d) determining whether the selected sub-tree structure satisfies one or more predetermined conditions; e) when the selected sub-tree structure satisfies *the* one or more predetermined conditions, replacing the selected sub-tree structure with the equivalent table to construct the data structure," and subsequently recites, "wherein *the predetermined conditions are* that: 1) an amount of memory required to store a data structure including the equivalent table in place of the selected sub-tree structure is smaller than that required to store the assumed tree structure; *and* 2) search performance of the data structure is not lower than that of the assumed tree structure."

The initial recitation of the "one or more predetermined conditions", because it was plural, did not include the indefinite article "a." Subsequent recitations refer to "the one or more predetermined conditions" and "the predetermined conditions." Moreover, the wherein clause of claim 24 clearly limits the recitation to make quite clear that "the predetermined conditions" must include both condition 1) *and* condition 2).

That is, in claim 24 the replacement of the selected sub-tree by the equivalent table occurs only if both conditions 1) and 2) are met. Independent claims 25-27 recite the conditions similarly and also are so limited. In view of the foregoing, to support a rejection, the prior art must show replacing the selected sub-tree by the equivalent table only if both conditions are met. No prior art has been identified that meets this limitation.

However, in both the Final Office Action and the Examiner's Answer, these claims were interpreted as if they recited that the replacement would occur if *either* of

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the conditions were met. In view of the above, it is clear that such an analysis is incorrect and that the rejections of claims 24-27, which rely upon this reasoning, are untenable.

(C) While it is not completely clear, it appears that the Examiner also took the position in the Answer that claims 24-27 do not even recite the feature that Applicant has been arguing. For example, at page 15 of the Answer, the Examiner states "examiner respectfully points out that an amount of memory required to store <u>the data structure</u> is smaller than that required to store the assumed tree structure relates only to claim 29." (Emphasis in original). It appears that the Examiner is relying on a difference in wording between claims 24-27 and claim 29 to avoid having to meet a feature of those claims.

At page 15 of the Answer, the Examiner states: "as recited in claims 24-27, precondition (1) is an amount of memory required to store <u>a data structure including the equivalent table</u> . . . is smaller than that required to store the assumed tree structure." (Emphasis and ellipsis in original). However, the Examiner has not quoted the entire recitation as it relates to the data structure. Claims 24-27 each read, in relevant part, "a data structure including the equivalent table *in place of the selected sub-tree structure* is smaller than that required to store the assumed tree structure." This limitation must be read as a whole and refers to a comparison between a *data structure in which the equivalent table has replaced the selected sub-tree structure* and the assumed tree structure (which includes the selected sub-tree).
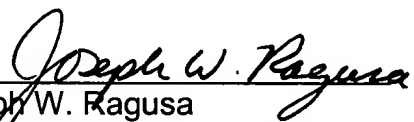
Applicant believes this limitation is clear, meets the requirements of Section 112, and must be accorded patentable weight, even though the wording is somewhat different than claim 29. In any event, as recited in any of the independent claims, this limitation is not met in the cited references, for at least the reasons set forth in detail in the Appeal Brief.

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The specific arguments relating to the patentability of the claims set forth in the Appeal Brief are maintained.

For at least the reasons set forth above, and those identified in the Appeal Brief, Appellant respectfully submits that the Final Office Action and the Examiner's Answer fails to even state a *prima facie* case under Section 103. Reversal of the final rejection of claims 7, 10, 14, 22, 24-27 and 29 is accordingly respectfully requested.

Dated: September 22, 2005   Respectfully submitted,

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Forwarding Table:

16bit

| 1 | 1 | | | | | | | | | | | | | | | * | | A |

| 1 | 1 | 0 | 0 | | | | | | | | | | | * | | | B |

| 1 | 1 | 0 | 0 | 1 | 1 | | | | | | | | * | | | | C |

| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | | | | * | | | D |

| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | | * | | | E |

| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | * | | F |

| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | * | G |

| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | H |

See Fig.6 in the patent application

A

11

Tree

00

11

8 nodes

00

11

00

11

00

replace

B

Equiv. Table

8 entries

C

(21+Y) bits

2bits 1bits   14bits   4bits   Ybits

0000···000000

Table node info flag

Tail entry flag

Data bit string

Search length

Related info

D

2bits 4bits x 4 =16bit   Y bits

Releated info

(18 + Y) bits

Memory consumption:

Tree
(18 + Y) * 8 $<$ Equiv. Table
(21 + Y) * 8

Appendix A